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EXAMINER

PAN, DANIEL H

ART UNIT	PAPER NUMBER
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2183

DATE MAILED: 09/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/001,719	PAVER, NIGEL C.	
	Examiner	Art Unit	
	Daniel Pan	2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,6,7,9,12,13,15-17,19,20,22-24,26,28,29,31 and 33-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,6,7,9,12,13,15-17,19,20,22-24,26,28,29,31 and 33-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

20

1. Claims 1,3,6,7,9,12,13,15,16,17,19,20,22,23,24,26,28,29,31,33-43 are presented for examination. Claims 2,4,5,8,10,11,14,18,21,25,27, 30, 32 have been canceled.

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1, 7, 13,19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The reasons are given blow.

3. As to claim 1,13,19, the language of the claim raises a question as to whether the claim is directed merely as to an abstract idea that is not tied to a technological art, environment or machine which would result in practical application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101. For example, the determination and the indication of the update in a register could be effected by pen on a paper in a table lookup, and the register could be represented by a symbol on the paper. No hardware type of the register is being reflected into the claim, therefore, the "register" could be a symbol in a flow chart on a paper, which does not require the use of hardware, therefore, it is not being tangible. Furthermore, claims to computer-related inventions that are clearly nonstatutory fall into the same general categories as nonstatutory claims in other arts, namely natural phenomena such as magnetism, and abstract ideas or laws of nature which constitute "descriptive material." Abstract ideas, Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759, or the mere manipulation of abstract ideas, Schrader, 22 F.3d at 292-93, 30

Art Unit: 2183

USPQ2d at 1457-58, are not patentable. Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data. Both types of "descriptive material" are nonstatutory when claimed as descriptive material per se. Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). When nonfunctional descriptive material is recorded on some computer-readable medium, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material stored in a computer-

Art Unit: 2183

readable medium does not make it statutory. Such a result would exalt form over substance. In re Sarkar, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978) ("[E]ach invention must be evaluated as claimed; yet semantogenic considerations preclude a determination based solely on words appearing in the claims. In the final analysis under 101, the claimed invention, as a whole, must be evaluated for what it is.") (quoted with approval in Abele, 684 F.2d at 907, 214 USPQ at 687). See also In re Johnson, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978) ("form of the claim is often an exercise in drafting"). Thus, nonstatutory music is not a computer component and it does not become statutory by merely recording it on a compact disk. Protection for this type of work is provided under the copyright law. Therefore, in the instant case, the updating of the register and the indicator bit are non-functional descriptive material, and therefore, it is nonstatutory.

4. As to claim 7, although claim 7 recites "a medium storing machine readable instructions that if executed enable a processor...", the language "if executed" is confusing. The reason is that it gives the uncertainty as to whether or not the real execution is being implemented. Therefore, based on the broadest interpretation, the scope of claim 7 is at best directed to an arrangement of program per se, such as the flow chart described in fig.2 on a paper in the applicant's specification before recognized by and executed in a machine.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1,7,13,19 are rejected under 35 U.S.C. 102(b) as being anticipated by Carnevale et al. (5,471,626).

6. As to claims 1, 7, 13,19, Carnevale taught a system including at least :

a) determining whether a first portion [130] of a register [register 126] of a processor has been updated (see fig.6 control field)) ; and if the first portion of the register is updated, setting an indicator bit (see A bit in 126 in fig.6) of an update indicator storage within a second portion [126] of (claim 1) , or within (claims 7,13,19) the register to indicate the update (see col.7, lines 6-16, see also how the first portion corresponded to second portion in a register in col.6, lines 60-67).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1,3,6, 7,9,12,13,15-17, 19,20,22-24,26,28, 29,31,33, 36,38,40,41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buchholz (4,740,893) in view of Carnevale et al. (5,471,626).

8. As to claim 1, Buchholz discloses a method comprising:

- a) determining whether a register of a processor has been updated',
- b) and if the register is updated, setting an indicator bit.

(Figure 1 shows a data processing system and figure 3 taught a set of vector registers in the vector processing unit of figure 1 (see column 2, Brief Description of Drawings). Column 6, lines 7-36 show that there are indicator bits or vector change bits (VCH) that indicate when a vector register pair has been loaded or modified (updated).

9. As to claims 7,38, Buchholz discloses an article comprising a medium storing machine-readable instructions that if executed enables a processor-based system to:

- a) determine whether a register of a processor-based system has been updated',
- b) and if the register is updated, set an indicator bit.

(Figure 1 shows a data processing system (processor) and figure 3 shows a set of vector registers in the vector processing unit of figure 1 (see column 2, Brief Description of Drawings). Column 6, lines 7-36 show that there are indicator bits or vector change bits (VCH) that indicate when a vector register pair has been loaded or modified (updated). These sections further show that the functionality is a direct response to instructions and figure 1, element 14 along with column 2, lines 37-43 show a memory that stores the instructions.).

Art Unit: 2183

10. As to claim 13, Buchholz discloses a processor comprising:

a) a register;

b) and a storage storing instructions to determine whether the register has been updated and if the register is updated, set an indicator bit. (Fig.1, see the data processing system (processor) and see fig.3 , the set of vector registers in the vector processing unit of figure 1 (see column 2, Brief Description of Drawings). Column 6, lines 7-36 show that there are indicator bits or vector change bits (VCH) that indicate when a vector register pair has been loaded or modified (updated). These sections further show that the functionality is a direct response to instructions and figure 1, element 14 along with column 2, lines 37-43 show a memory that stores the instructions.)

11. As to claim 19, Buchholz discloses a system comprising:

a) processor having a register;

b) and a storage to store instructions to determine whether the register has been updated and if the register has been updated, set an indicator bit.

(e.g. see Fig. 1 , a data processing system (processor) and fig.3 , the set of vector registers in the vector processing unit of figure 1 (see column 2, Brief Description of Drawings). Column 6, lines 7-36 disclosed indicator bits or vector change bits (VCH) that indicate when a vector register pair has been loaded or modified (updated). These sections further show that the functionality is a direct response to instructions and figure 1 , element 14 along with column 2, lines 37-43 disclosed a memory that stored the instructions.)

12. As to claims 1,7,13,19, Buchholz did not specifically showed the indicator was in the second portion of (claim 1) , or within (claims 7, 13, 19) , the register as claimed. However, Carnevale disclosed a an indicator in a second portion (see fig.6, [126 A]) of a register [124] to indicate the update of a first portion [[130] in the register (see col.7, lines 7-15). It would have been obvious to one of ordinary skill in the art to use Carnevale in Buchholz for including the second portion of the register for indicating the update as claimed because the use of Carnevale could provide Buchholz the ability to reflect the updated information into the register in an integrated register format, therefore, minimizing the hardware overheads and the R/W operation thereof of the system in Buchholz, and because Bucchholz also taught a VCH bit filed which changed upon the changing state of the VIU bit filed within the same register,(see the VCH bit), which was a suggestion of the applicability of indicating the state change, update, or the like, into the same register in order to reduce the hardware overheads, and for doing so, provided a motivation.

13. As to claims 36, 38, Buchholz's status register was a main register.

14. As to claim 40, Buchholz also included storage of instructions (see processor storage in fig.I , col.2, lines 37-43).

15. Buchholz also disclosed the register has been updated by checking the indicator bit. (see figure 5b [260] that the VCH indicator bits are checked and thus it is determined whether the corresponding register pair has been updated.)

16. As to claim 3, Buchholz discloses the method of claim 2 wherein if the register has not been updated, refraining from transferring the contents of the register back to a memory. (Figure 5b and the abstract show that if the contents of a register (VR or vector register) have not been changed ($VCH = 0$) the register is not saved to memory.)

17. Buchholz also disclosed determination of the register updated and saved the contents of the register to memory. (see fig. 5b and the abstract.)

18. Buchholz also included saving the register contents to memory on a context change. (see abstract and column 8, lines 16-54 show that the registers are saved on a program or context switch.)

19. As to claim 6, Buchholz discloses the method of claim 1 including assigning a single indicator bit as the indicator bit for a plurality of registers. IAS shown above, the change bits (VCH) or indicator bits are each associated with a register pair.)

20. Buchholz also disclosed storage of instructions that enable the processor-based system to determine whether the register has been updated by checking the indicator bit. (Figure 5b shows in step 260 that the VCH indicator bits are checked and thus it is determined whether the corresponding register pair has been updated.)

21. As to claim 9, Buchholz disclosed storing instructions that enable the processor-based system to refrain from transferring the contents of the register back to a memory if the register has not been updated. (figure 5b and the abstract show the contents of register (VR or vector register) not changed ($VCH = 0$), and the register was not saved to memory.)

22. Buchholz also disclosed storing instructions that enable the processor-based system to determine whether the register has been updated and if so, save the contents of the register to memory. (e.g. see fig. 5b and abstract.)

23. Buchholz also disclosed storing instructions that enable the processor-based system to save the register contents to memory on a context change. (the abstract and column 8, lines 16-54 , see the registers saved on a program or context switch.)

24. As to claim 12, Buchholz disclosed storing instructions that enable the processor-based system to save the contents of a plurality of registers to memory if the indicator bit is set. As show above, the change bits (VCH) or indicator bits are each associated with a register pair and thus on a save each set indicator or VCH bit allows for two registers' contents to be saved.)

25. Buchholz also disclosed storage stores instructions that enable the processor to determine whether the register has been updated by checking the indicator bit. (Fig. 5b , see the step 260 , the VCH indicator bits are checked and thus it is determined whether the corresponding register pair has been updated.)

26. As to claim 15, Buchholz discloses the processor of claim 14 wherein the storage stores instructions that enable the processor to refrain from transferring the contents of the register back to a memory. (Figure 5b and the abstract show that if the contents of a register (VR or vector register) have not been changed (VCH = 0) the register is not saved to memory.)

Art Unit: 2183

27. As to claims 16,41, Buchholz disclosed storage stores instructions that enable the processor to determine whether the register has been updated and if so, save the contents of the register to memory. (See figure 5b and abstract.)

28. As to claim 17, Buchholz taught storage of instructions that enable the processor to save the register contents to memory on a context change. (see abstract and column 8, lines 16-54 show that the registers are saved on a program or context switch.)

29. Buchholz also disclosed a second storage to store said indicator bit. (Column 5, line 62-column 6, line 26 shows that a vector status register holds the indicator or VCH bits.)

30. As to claim 20, Buchholz disclosed a memory and an interface between said memory and said processor. (figure 1 , see the interface from the storage (20) and the rest of the processor.)

31. Buchholz also disclosed the storage stores instructions that enable the processor to determine whether the register has been updated by checking the indicator bit. (see figure 5b [260] the VCH indicator bits are checked and thus it is determined whether the corresponding register pair has been updated.)

32. As to claim 22, Buchholz disclosed the storage of instructions that enable the processor to refrain from transferring the contents of the register back to the memory. (e.g. see fig. 5b and the abstract disclosed that if the contents of a register (VR or vector register) have not been changed (VCH = 0) the register is not saved to memory.)

Art Unit: 2183

33. As to claim 23, Buchholz disclosed storage of instructions that enabled the processor to determine whether the register has been updated and if so, save the contents of the register to the memory. (See figure 5b and abstract.)

34. As to claim 24, Buchholz disclosed storage of instructions that enabled the processor to save the register contents to memory on a context change. (see abstract and column 8, lines 16-54 show that the registers are saved on a program or context switch.)

35. Buchholz also disclosed the second storage to store said indicator bit. (Column 5, line 62-column 6, line 26 shows that a vector status register holds the indicator or VCH bits.)

36. As to claim 26, Buchholz also included control register to store said indicator bit and wherein said storage storing instructions and said control register are part of said processor. (e.g. see figure 1, memory (20) and the Vector Processing Unit (which has been shown in the brief Description of Drawings to hold the vector registers) are in the processor.

37. Buchholz also included plurality of registers coupled to said processor and a single indicator bit as the indicator bit for all of those registers. (As shown above there are register pairs (a plurality of registers) associated with each change or indicator bit.)

38. As to claim 28, Buchholz did not save the register contents to memory on the context change if the register has not been updated. (e.g. see figure 5b and the abstract

Art Unit: 2183

, if the contents of a register (VR or vector register) not been changed (VCH = 0) the register was not saved to memory.)

39. As to claim 29, Buchholz also taught instructions that enable the processor-based system to not save the register contents to memory on the context change if the register has not been updated. (figure 5b and the abstract show that if the contents of a register (VR or vector register) have not been changed (VCH = 0) the register is not saved to memory.)

40. As to claim 31, Buchholz taught the register comprised a control register. Since the indicator bit in the register controls the storage to memory, it may be appropriately named a control register.)

41. As to claim 33, Buchholz taught register comprised a control register. (Since the indicator bit in the register controls the storage to memory, it may be appropriately named a control register.)

42. Claims 34, 37, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buchholz et al. (4,740,893) in view of Carnevale et al. (5,471,626) as applied to claims 1, 7, 13, and further in view of Russel (6,751,737) .

43. As to claims 34, 37 , 39, limitations of parent claims have been discussed above, and it will not be repeated herein. Neither Buchholz nor Carnevale specifically showed the context switch as claimed . However, Russel taught a clearing of an indicator (MVM context register 128) upon occurrence of context switch (see the data in MVM context

Art Unit: 2183

register 128 indicating whether the execution environment was initialized upon the election of first context in col.7, lines 39-52, see also the background of context switch in col.1, lines 10-15,50-61 , see also MVM context switching in col.2, lines 46-54).

44. It would have been obvious to one of ordinary skill in the art to use Russell in Buchholz for including the clearing of the indicator upon the context switch as claimed because the use of Russell could provide Buchholz the ability to adapt to different system conditions at a predefined processing format, and therefore, increasing the adaptability of Buchholz, and because Buchholz did disclose the restoring of system states as indicated by the status register fields (see col.6, lines 7-53) , and therefore, provide a suggestion of the need of a context switch in order to enhance the adaptability in the system.

45. Claims 35,42,43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buchholz (4,740,893) in view of Carnevale et al. (5,471,626) as applied to claims 1,3,19,20 above, and further in view of Dynarski et al. (6,628,671).

46. As to claims 35, 42,43, limitations of parent claims 1,3,19,20 have been already discussed above in this action, therefore, it will not be repeated herein.

47. Neither Buchholz nor Carnevale specifically show the power consumption of battery operation as claimed. However, Dynarski disclosed a system including a battery operated system (see the context switching in abstract, see also the laptop computer in Col.1, lines 5- 37). It would have been obvious to one of ordinary skill in the art to use Dynarski in Buchholz for reducing the power consumption as claimed because the use

Art Unit: 2183

of Dynarski could provide the control ability of Buchholz to enable the system based on the activities of system , and therefore, reducing the power consumption on idle processing cycle, and because Dynarski also taught his mobile user system was used for a context switching operation (see Abstract, lines 8-20) , which was a suggestion of the applicability of the battery operated system , or the portable device into a context switching system ,such as the one taught by Buchholz, and in doing so, provided a motivation.

48. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Golliver (5,928,356) is cited for the teaching of the status indicator of register in context switching (see col.4, lines 6-45) .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Pan whose telephone number is 703 305 9696, or the new number 571 272 4172. The examiner can normally be reached on M-F from 8:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chan, can be reached on 703 305 9712, or the new number 571 272 4162. The fax phone number for the organization where this application or proceeding is assigned is 703 306 5404.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Art Unit: 2183

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